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## Scientific Method REVIEW SHEET

Use your "Introduction to Science and the Scientific Method" Notes to answer the questions below.

1. The goal of science is to \_\_\_\_\_ and \_\_\_\_\_ the natural world, to explain events in the natural world, and to use those explanations to make useful \_\_\_\_\_.

2. Science deals only with the \_\_\_\_\_ world.

3. Scientists collect and organize information in a careful, \_\_\_\_\_ way, looking for \_\_\_\_\_ and

\_\_\_\_\_ between events.

4. **Science** - an organized way of using \_\_\_\_\_ to learn about the natural world.

5. List the 5 steps of the Scientific Method

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

e. \_\_\_\_\_

6. **Data** - the information gathered from making \_\_\_\_\_.

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7. There are two types of data:

a) **Quantitative data** are numbers and are obtained by \_\_\_\_\_ or \_\_\_\_\_.

b) **Qualitative data** are \_\_\_\_\_ and involve \_\_\_\_\_ that cannot be counted.

8. A **hypothesis** is a \_\_\_\_\_ for a set of observations

9. A hypothesis must be stated in a way that makes it \_\_\_\_\_. The hypothesis is just a \_\_\_\_\_ answer to a question, and it must be thoroughly \_\_\_\_\_.

10. In the Observation step - A \_\_\_\_\_ or a \_\_\_\_\_ must first be identified.

11. In the Form a Hypothesis step - A \_\_\_\_\_ to the question or problem is formed. It is simply a prediction and has not yet been proven or disproven.

12. When Designing a Controlled Experiment, many factors should be considered. **Variables** - the \_\_\_\_\_ in an experiment that can be \_\_\_\_\_

13. A controlled experiment works with \_\_\_\_\_ variable at a time.

14. In a "controlled experiment" only one variable is changed at a time. All other variables should be \_\_\_\_\_ or "controlled".

15. An experiment is based on the \_\_\_\_\_ between a "control group" with an "experimental group".

a) These two groups are \_\_\_\_\_ except for one factor.

b) The control group serves as the comparison. It is the same as the experiment group, except that the one variable that is being tested is removed.

c) The experimental group shows the \_\_\_\_\_ of the variable that is being tested.

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16. The \_\_\_\_\_ variable is the variable that is deliberately changed by the scientist.

17. The \_\_\_\_\_ variable is the one observed during the experiment. The dependent variable is the data we collect during the experiment. This data is collected as a result of changing the independent variable.

18. When **Recording and Analyzing**, The data that has been collected must be \_\_\_\_\_ and \_\_\_\_\_ to determine whether the data are \_\_\_\_\_.

19. When **Drawing Conclusions**, The \_\_\_\_\_ from the experiment is used to determine if the hypothesis is proven or disproven.

20. Experiments must be \_\_\_\_\_ over and over. When repeated, the results should always be \_\_\_\_\_ before a valid conclusion can be reached.

21. When **Forming a Theory**, A \_\_\_\_\_ may be formed after the hypothesis has been tested many times and is supported by much evidence.

22. A **theory** is a broad and comprehensive statement of what is thought to be \_\_\_\_\_ and a theory is supported by considerable \_\_\_\_\_.

**In your own words, answer the questions below.**

23. Why is it important to have a large sample size in any experiment?

24. Why is it important to repeat the experiment many times?

25. What is the importance of using a control or a group that doesn't have any "experiment" done on it?

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26. How is a theory different than a hypothesis?

27. Why is it so important that a scientist accurately describes the procedure or steps used in the experiment?

28. What is the difference between the independent and the dependent variables in an experiment?

29. What are some questions or problems you would like to investigate in Science class this year?

30. Pick one and write a hypothesis for your question or problem.